

REMARKS

Claims 2, 5 to 10, 12, 13, 15 to 20, and 23 to 32 are pending in this application.¹ Of these, claim 1 is independent, and claims 8 and 9 have been withdrawn from consideration. Favorable reconsideration and further examination are respectfully requested.

In the Office Action, independent claims 4 and 22 were rejected over U.S. Patent No. 6,441,703 (Panasik '703) in view of U.S. Patent No. 6,744,336 (Goetz) and U.S. Patent No. 6,768,396 (Klee); independent claim 21 was rejected over Panasik '703 in view of Goetz; and independent claim 23 was rejected over Panasik '703 in view of Goetz, Klee and U.S. Patent No. 5,872,493 (Ella). The dependent claims were rejected variously over these references and over U.S. Patent No. 6,087,198 (Panasik '198). All independent claims except for claim 23 have been cancelled. Claim 23 has been amended, as shown above.

In this regard, independent claim 23 recites a component comprising a plurality of resonators that form at least a portion of a circuit. The plurality of resonators comprise layer structures above a wafer. Each of the layer structures comprises first and second electrode layers that comprise electrodes, and at least one piezoelectric layer that is between the first and second electrode layers. A dielectric layer is above the plurality of resonators. The dielectric layer comprises a hermetic encapsulation for the plurality of resonators. The dielectric layer comprises a material and has a thickness that results in a first acoustic impedance. The material comprises a low-K dielectric. The dielectric layer has top and bottom surfaces that substantially follow a topology of the plurality of resonators. A metal layer is above the dielectric layer. The metal layer comprises a material and having a thickness that results in a second acoustic

¹ The Examiner is urged to independently confirm this recitation of the pending claims.

impedance. The second acoustic impedance is higher than the first acoustic impedance. The metal layer and the dielectric layer are parts of an acoustic mirror. The wafer has a surface comprising solderable contacts that are electrically connected to the plurality of resonators or to one or more of a plurality of active and/or passive components integrated with the plurality of resonators in circuits. The plurality of resonators are electrically interconnected by electrode layers of the resonators to form the at least a portion of a circuit.

The applied art is not understood to disclose or to suggest the foregoing features of claim 23. In this regard, the Office Action admits that Panasik '703 does not show that the dielectric layer is above a resonator structure, that the dielectric layer comprises a hermetic encapsulation for resonators, or that there is a metal layer above the dielectric layer.² Furthermore, as is clear from Panasik '703³, and as was admitted on page 3 of the Office Action, the dielectric layer of Panasik '703 is planar. This is different from claim 23, in which the dielectric layer has top and bottom surfaces that substantially follow a topology of the plurality of resonators.

Goetz was cited for its disclosure of a hermetic seal. However, the hermetic seal in Goetz is a passivation layer 430, which has nothing whatsoever to do with an acoustic mirror formed by a metal layer and a dielectric layer that substantially follows a topology of a plurality of underlying resonators. It was further stated in the Office Action⁴ that "it would have been considered obvious to one of ordinary skill in the art to have the SiO₂ reflector/mirror comprise the hermetic seal such [as] suggested by Goetz, especially since Panasik suggests that the reflector/mirror provides hermetic sealing". This statement is factually incorrect; therefore, the

² Office Action, page 3

³ See, e.g., Figs. 1, 5 and 6 of Panasik '703

⁴ Office Action, page 4

obviousness argument on which it is predicated is also factually incorrect. Panasik '703, in fact, states, in the following excerpt, that hermetic sealing is not required.

FIG. 6 illustrates an acoustic resonator 250 disposed between a first acoustic reflector array 252 and a second acoustic reflector array 254. The first acoustic reflector array 252 is disposed on a substrate 256 and provides a solid support for the acoustic resonator 250 as previously described in connection with FIGS. 3-5. The second acoustic reflector array 254 provides a suitable distributed reflector cover for the acoustic resonator 250. The monolithic cover protects the acoustic resonator 250 from humidity, dust and other contaminants. Thus, operating conditions are improved, failures reduced, and packaging costs are reduced as the cover eliminates the need for a hermetic package.⁵ (emphasis added)

Thus, the reflector in Fig. 6 covers only the top of the resonator. It does not cover its sidewalls to form a hermetic seal, as is clear from the figure and the text. Accordingly, there is no suggestion in Panasik '703 of the need for a hermetic seal, as indicated in the Office Action.

In fact, the foregoing statement of Panasik '703 actually *teaches away* from incorporating a hermetic seal, such as that described in Goetz, into the Panasik '703 system. Given this, the combination of Goetz and Panasik '703 is improper as a matter of law.

Klee was cited for its alleged disclosure of a low-K dielectric for acoustic reflectors, but is not understood to remedy the foregoing deficiencies of Panasik '703 and Goetz. In this regard, Klee shows a reflector layer 2, which is adjacent to a substrate. There, however, is no suggestion to use the materials of this reflector layer in an acoustic mirror of the type claimed.

Ella was cited for its alleged disclosure of solderable contacts, and is not understood to remedy the foregoing deficiencies of Panasik '703, Goetz and Klee.

For at least the foregoing reasons, claim 23 is believed to be patentable.

⁵ Panasik '703, col. 7, lines 23 to 32

Each of the dependent claims is also believed to define patentable features of the invention. Each dependent claim partakes of the novelty of its corresponding independent claim and, as such, has not been discussed specifically herein.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney can be reached at the address shown below. All telephone calls should be directed to the undersigned at 617-521-7896.

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Serial No. : 10/523,872
Filed : February 7, 2005
Page : 14 of 14

Attorney's Docket No.: 14219-078US1
Client Ref.: P2002,0698USN

Please apply any fees or credits due in this case, which are not already covered by check,
to Deposit Account 06-1050 referencing Attorney Docket No. 14219-078US1.

Respectfully submitted,

Date: November 7, 2007



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